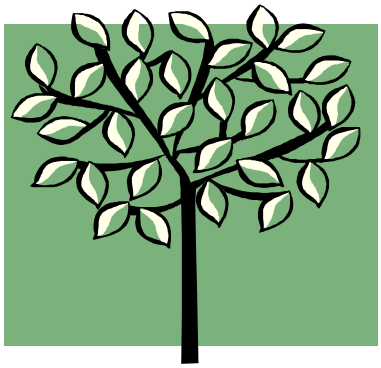
VOLUME 5, ISSUE 1 SPRING ISSUE—MAY 2010

The Stand Manager

Technical Development, Planning and Utilization Unit Newsletter
NC Division of Forest Resources—DENR



Tech Updates

Ron Myers

The recent National Woodland Owner Survey indicates that family forest owners have many different management objectives, values, and reasons for ownership. Natural resources professionals who educate and serve these new forest owners will need to apply different approaches to meet these changing resource management needs by family forest landowners. The Division of Forest Resources is actively involved in several landowner survey projects to better understand NIPF landowner's interests and how our agency can effectively reach more landowners.

In this issue we highlight some accomplishments of the Community Protection Plan program and the innovative work that our Nursery & Tree Improvement program continues to provide. Future research and efforts may be directed to projects that help to restore fire adapted species and ecosystems along with restoration of species in decline. The Forest Health program continues to utilize new technology to provide accurate and updated information from periodic surveys. A brief overview of Forest Certification in NC is provided for educational and outreach purposes.

"Life is change. Growth is optional. Choose wisely."—Karen Kaiser Clark

Inside this issue:

Forest Protection

By James Rogers

NC Division of Forest Resources Actively Involved in Community Protection Plans (CPP's)

The USDA Forest Service's Community Protection Grant Program (also known as the **Steven's Amendment Grant Program**), through the National Fire Plan, was established to provide funding to states to proactively prevent and mitigate wildland fire hazards that have the potential to threaten communities surrounding National Forestland. The program emphasizes collaborative planning to maximize mitigation and prevention efficiency.

The NCDFR, USDA Forest Service, local communities and other cooperators have been working together to develop a mitigation and prevention plan for each National Forest in North Carolina. These plans serve as a guide to identifying and mitigating wildland fire hazards that my potentially threaten communities surrounding National Forests. These detailed plans list fuel mitigation techniques and community projects in priority order based on wildland fire hazards, wildland-urban interface (WUI), and available funding. These four plans are collaboratively updated annually each September.

Upcoming Joint Meeting of the NC Prescribe Fire Council & the NC Longleaf Coalition

August 18-19th, 2010, Location TBA

Forest Protection Continued

Work is currently being performed in districts where National Forestland is located and includes **NC DFR Districts 1, 2, 3, 4, 9, and 10**. The criteria for areas to be included in the plan and receive grant funding are; 1) the area must be within three miles of a national forest boundary and 2) be considered a community at risk from wildfire. As long as the area meets the two previous qualifiers, work can be performed on private and public lands.

The overall goal of the Community Protection Grant Program is to maximize acreage treated within the wildland-urban interface (WUI) that share boundaries with National Forestland. Sites within the wildland-urban interface (WUI) areas receive top funding priority for potential grant projects.

Table 1: Summary of NC CCP Activity by Fiscal Year and National Forestland

NC CCP Activity Report	FY 07-08	FY 08-09
Total acres treated	1891	2873
Acres Treated by National Forest		
Uwharrie	1891	1924
Croatan		348
Nantahala		420
Pisgah		181

Montgomery County has been actively involved in CPP work the past two years, successfully using prescribed fire as a fuel mitigation technique around Uwharrie National Forest land.

Pictured: Montgomery County Ranger Scott Maynor (bottom right) and ACR Jason Haywood (top right)

Nursery & Tree Improvement News

By James West and Ken Roeder, Ph.D. (Nursery & Tree Improvement Program Head and Forest Geneticist)

Mass Controlled Pollination (MCP) Seedlings Now Available From NC DFR Nursery

Deployment of genetically improved Loblolly pine by the Division of Forest Resources has taken another step forward. **The Nursery & Tree Improvement Program has initiated Mass Controlled Pollination (MCP) in its 3rd cycle Loblolly pine seed orchards in Goldsboro**. In addition to producing open pollinated seed from our genetically improved seed orchards, MCP seed is now also being produced.

Mass Controlled Pollination (MCP) is a method of seed production aimed at producing commercial quantities of the very best specific genetic combinations, such as Female "A" crossed with Male "B". By manually making these specific crosses, the Nursery and Tree Improvement Program can produce more of the very best genetically improved seed from our Seed Orchards.

This method requires the bagging of female flowers prior to them becoming receptive to pollination by the resident pollen cloud. When the bagged flowers are receptive for pollination, pollen from specific desired father trees is injected onto the female flowers in the bags. Genetic gains from the very best parents can therefore be maximized by these seed production efforts. Thousands of pollination bags and flowers are involved. As the most desirable seed orchard trees produce more flowers over the next couple of years, seed production by MCP will expand. We have also started to make specific MCP crosses of our very best trees as requested by several of our seedling customers.

DFR Nursery & Tree Improvement staff bagging pre-receptive female Loblolly pine flowers

BIG-BLUP has arrived

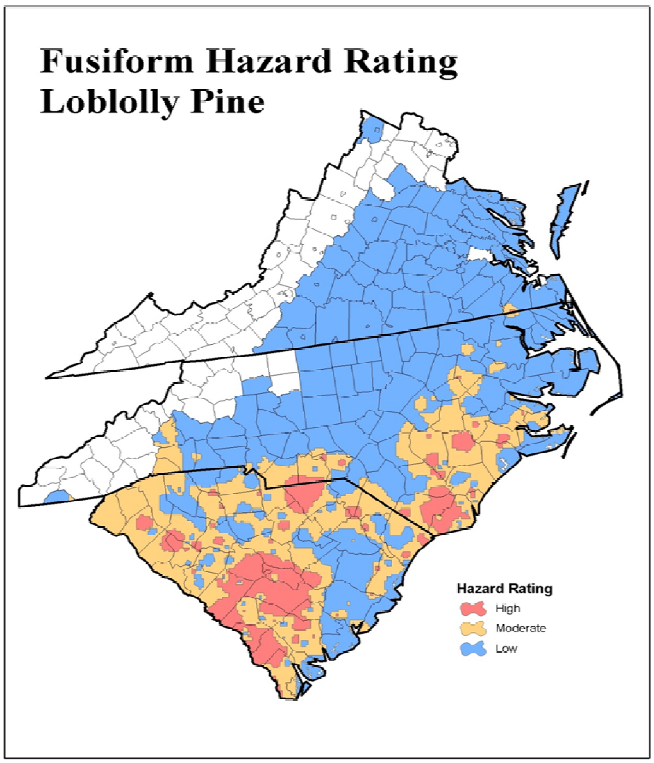
The latest analyses of 50+ years' worth of Loblolly pine genetics data has been completed by the NCSU-Tree Improvement Cooperative in Raleigh. These analyses, called **BIG-BLUP**, for Best Linear Unbiased Prediction of Breeding Values, better incorporates ancestry, progeny and other degrees of relatedness and larger breeding zones in estimating genetic breeding values.

Pollination bags in place for MCP breeding

BIG-BLUP has been completed for the Coastal, Piedmont and Northern breeding zone populations of Loblolly pine. North Carolina is in a unique position to have all three of these zones within its boundaries.

This allows the Tree Improvement Program to utilize the best genetics from all of these breeding populations. In addition to the ***productivity, rust*** and ***straightness*** scores we are currently using in each ***deployment zone*** with the **Loblolly Pine PRS™** rating system, the **BIG-BLUP** analysis includes ***height*** and ***forking*** scores. These new analyses are being used to select the most desirable crosses for our MCP seed orchard breeding. **BIG-BLUP** is also being used to update the **Loblolly Pine PRS™** rating system.

Nursery & Tree Improvement News Continued



Look to find even better genetically improved seedlings to become available from Claridge Nursery in the near future.

Associated with the ongoing work to recommend specific genetically improved Loblolly pine clones, the Nursery & Tree Improvement Program has released a map that had been developed by the **USDA-Forest Service** in Asheville using the historic and recent **Forest Inventory Analysis (FIA)** data.

This map shows rust hazard areas for Virginia and South Carolina as well as for North Carolina. The objective of this work is to further increase Loblolly pine yields across the state by recommending the planting of specific genetically resistant clones for areas with high fusiform rust potential.

If used properly, the rust rating in **Loblolly Pine PRS™** rating system can be an effective tool to match desired stand growth and disease resistance traits for specific management objectives and sites.

Seed Pretreatment Experiments Yield Interesting Results

Research on habitat restoration in South Africa and Australia has motivated the **DFR Nursery Program** in Goldsboro to initiate experiments on using seed exposure to smoke as a pretreatment to increase seed germination potential. Published research has identified a chemical in smoke which may help to break seed dormancy in certain tree and plant species.

The researchers were working with species which evolved in fire adapted ecosystems. The dormancy breaking chemical is also reported to work on species from non-fire ecosystems and even on agricultural species like corn and soybeans.

The DFR Nursery Program is experimenting with this smoke pretreatment technique for use on species with low germination potential and long germination times. The nursery is running seed germination studies on **Longleaf pine**, a fire ecosystem species, to confirm any beneficial germination effects from treatments. Early results have been interesting. **Figure 1** is a graphical presentation of some early germination results from treatments.

Prototype Smoker made from trash can

It appears that short durations (15 minutes) from smoke exposure may be beneficial to increasing germination of longleaf pine. Further study will look at the effects on unstratified seed, seed exposure, exposure intervals, smoke intensity, pretreatment techniques, equipment, and other species.

The smoke pretreatment is also being tested for compatibility with other cultural practices currently being used at the nursery. The Nursery Program could potentially use this seed pre-germination technique on hard to germinate species like Fraser Fir and Atlantic White Cedar (Juniper).

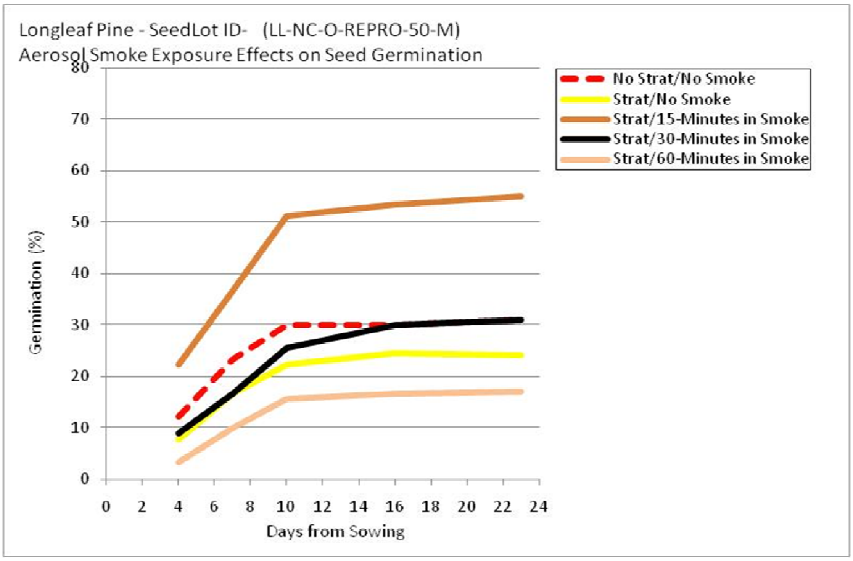


Figure 1: Aerosol Smoke Exposure Treatment Effects on Seed Germination

Any pretreatment method or technique that can increase the germination capacity of hard to germinate species, will increase the nursery efficiency of producing more genetically improved seedlings at a lower cost.

Tree Improvement West Increases Seed Production of Fraser fir Advanced Generation Selections

Tree Improvement-West (TI-West) has been trying to hasten initiation of flowering and increase seed production of our next generation of Fraser fir selections. The goal is to quickly obtain limited quantities of flowers for breeding and seed for genetic testing. Two primary ways have been attempted: **1) to top graft sexually immature branchlets (scions) of field selected trees onto sexually mature trees in our orchards; and 2) to top late juvenile grafted trees to induce them to produce sexually mature top branches full of flowers.**

Top grafting so far has had limited success. TI-West has found however, that the topping of grafted trees has forced them to increase the branch area for production of female flowers on their shortened tops (**Figure 2**). More female flowers result in more viable seed in a given year. This allows us to field test these selections sooner and be able to make new selections for our next generation. Topping these trees at 5 to 6 feet also makes these orchard trees more manageable for breeding and seed collection.

This technique has allowed us to collect sufficient quantities of seed for genetic testing. Seed from these advanced generation selections are currently being grown at Linville River Nursery. Look for our next generation of greenhouse seedlings to be available over the next couple of years from Linville River Nursery.

Figure 2: Topped Fraser fir tree in orchard

Forest Health—Technology Transfer

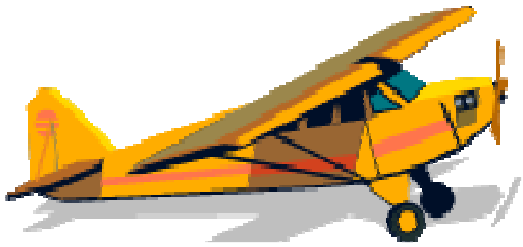
By Jason Moan—FHM Coordinator

Digital Aerial Sketchmapping

A grease pencil and a box of aerial photos. A gazetteer or district map and a pencil. A handheld GPS unit. These are all tools that have been used by the North Carolina Forest Service over the years during aerial surveys. Each set of tools has it's pros and cons and unless you have a very high level of familiarity with the location you're surveying, you could spend all your time trying to locate yourself on the map and miss significant areas of forest damage. Our ability to accurately map damage points has improved since handheld GPS units became a standard aerial survey tool, but the issue of accurately tracking the location of the plane continues to present us with difficulty.

In recent years, the standards by which we report our yearly forest health aerial survey data to our federal partners has seen a **shift toward entirely spatially-referenced data**. That means that anything we submit must have latitude and longitude coordinates or be otherwise identifiable in a georeferenced format. For the last year or so, we've been required to submit GIS versions of our annual aerial survey flightlines. We've come a long way since this requirement was instituted. We were initially hand-digitizing the flightlines based on our flight plans. Since then, the standard has been to carry a handheld GPS to track the route of the plane during flight. This is an effective method, but technology and new equipment are providing for greater improvements.

In the summer of 2009, the Pest Control Branch purchased 6 Armor X10 ruggedized tablet PCs for use during our yearly aerial surveys. These machines, more commonly called **Digital Aerial Sketchmappers (DASMs)**, feature a 10.4 inch screen and weigh only 5.2 pounds. The DASM comes with a Bluetooth GPS unit that can be connected and placed in the windshield of the plane. **The DASM** is also loaded with ArcGIS software and a software product called **Geolink.** Geolink can be loaded with flight and mission specific files such as: topographic maps, aerial photos, and pertinent shapefiles such as roads, state or county boundaries, and previous forest damage points or polygons.



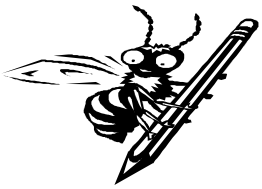
The Geolink software uses the GPS connection to show your location as the topographic maps, aerial photos, or shapefiles pass beneath you. It is easy to switch between photos and maps while you fly with just the click of a button. During flight, Geolink automatically records your flightline, which is downloadable in a GIS format after your flight. In addition to tracking flightlines, another benefit of using the DASM is how easy it is to mark areas of interest during flight.

The DASM has a stylus and touch screen technology. If you're flying and happen to see a beetle spot, you simply pick up the attached stylus and draw the point or polygon right on the screen of the computer, using the maps or photos to quickly locate the spot. You can also assign attributes to that spot, such as ground check priority and/or number of trees affected. When you complete your flight, this information can also be downloaded in a GIS format, complete with the attributes you entered.

Since their purchase, the DASMs have been tested by Pest Control Staff and many Southern Pine Beetle Foresters and district pest control contacts. Informal trainings on operation of the DASM were given on an 'as requested' basis, however **the first official trainings in the use of this new tool were conducted May 12, 2010 in Morganton and May 13, 2010 in Goldsboro**. These trainings focused exclusively on the DASM's use in forest health aerial surveying. Trainings for other uses of the DASMs are under development at this time.

The DASM has the potential to greatly improve the way we conduct aerial surveys, but aerial surveying is not the only application for the DASM, which shows great potential in many aspects of our jobs. The DASM could be carried on water quality exams, allowing the user to draw stream crossings, SMZs, violations, etc directly onto the screen and convert it to a GIS format for follow-up efforts. There is also interest in the use of these machines in fire control. Field observers could carry the DASM with them and directly map fire boundaries, water sources, hazards, and even type in weather data in association with a specific area or point. The field observer could view all mapped locations in reference to one another and, after returning to the base camp, the GISS could transfer all the mapped data into ArcGIS in a matter of minutes. There is also the potential to use the DASM in conjunction with the infrared camera for mapping hotspots.

When the DASM setup and associated training has been completed, the DASMs will be divided up across the state for field use. One DASM will be housed at each regional office and one will be housed at each Pest Control office location. These will be available to field personnel who have completed the required training, the details of which are still in development at this time.



Field Notes: Special Projects & FM Activities submitted by County personnel or Foresters

Ranger Training Classes of 2009

Ranger Training Level I Class with 3 Instructors

Ranger Training Level II Class with 23 Professionals

Forest Management

By Ron Myers and Michael Mann

Forest Certification in North Carolina

Forest certification is a relatively new development since the 1990's, and deals not with the final product, but the practice of forestry, growth of the product, harvesting of the product, and ecological impacts associated with the harvesting of the product (Klingberg 2003). Forest certification has been promoted as a tool for broader public acceptance of forest management and for achieving environmental, social, and economic benefits on certified forests (Moore 2008). The concept of forest certification has emerged as a management tool to attain sustainable forestry using a voluntary market approach rather than a regulatory approach.

Four major certification systems are active in North Carolina. These organizations are Sustainable Forestry Initiative (SFI), Forest Stewardship Council (FSC), Green Tag, and American Tree Farm System (ATFS).

Forest Management Continued

Of the 4 Forest certification systems, SFI and ATFS fall under the Program for the Endorsement of Forest Certification (PEFC), the world's largest forest certification umbrella organization endorsing national and/or regional forest certification standards that meet its rigorous sustainable forest management criteria. **Forest Stewardship Council (FSC) certified forestlands currently amount to about 12,000 acres in NC**, all of which are privately owned. Comparatively, the **Sustainable Forestry Initiative (SFI) and American Tree Farm System (ATFS) certify about 352,000 and 1.1 million acres respectively.** Over 65 percent of the forestland enrolled under the ATFS is owned by NIPF landowners making the ATFS the most accessible forestland certification system for this ownership group in NC. Recently, the ATFS has modernized its standards and guidelines in order to reach PEFC sustainability benchmarks. In 2009, ATFS was audited at the National level and received third party certification from PEFC. **Forest industry forestlands are certified by both the SFI and the ATFS, with SFI accounting for nearly 90 percent of the certifications.** North Carolina has a very active statewide SFI implementation committee. **The primary certification alternatives at the present time work best for larger NIPF's, but are currently difficult and costly for the average NIPF landowner to implement (Mercker 2006).**

Very few family forest landowners are aware of forest certification programs. In the U.S., only 12 percent of the family forest owners, who own 24 percent of the family forest land, have heard of forest certification with very few family forest landowners (<1 percent by ownership) currently enrolled in a forest certification program (Butler 2008). By comparison, **less than 5 percent of NC family forest landowners** who responded to a 2006 NWO survey were **familiar with forest certification programs or have land currently enrolled** (Butler 2008). Mercker (2006) found that NIPF landowners most likely to consider forest certification were typically well educated, professionals that were new at forest land ownership, had received advice or information about their forestland, and desired to stay up-to-date with new forestry practices and programs.

Having a good knowledge of forest certification is a precondition for NIPF landowner participation. Lindstrom (1999) found that without adequate knowledge of forest certification, private forest landowners are not likely to participate, no matter how good the certification system. Mercker (2006) found that the top reasons landowners chose for certifying their forests were if certification 1) made their forest healthy, 2) improved wildlife habitat, or 3) saved money by reducing the likelihood of future regulation.

Increased future efforts will be needed in education, outreach, training, and a collaborative effort between resource management agencies, forest industry, NGO's, and natural resource professionals to promote forest certification in North Carolina.

Forest Certification may become a more important tool to many forest landowners in NC to demonstrate a commitment to forest sustainability and a long-term dedication to proper management and stewardship of our forest resources.

Reference Literature:

Mercker, David. 2006. ***Forest Certification and Nonindustrial Private Forest Landowners: assessing awareness, acceptance, and educational preferences.*** PhD Dissertation. The University of Tennessee, Knoxville. 129pp.

Mercker, D.C., and D. Hodges. 2007. **Forest Certification and NIPF Landowners: Who Will Consider Certifying and Why?** Journal of Extension. Vol. 45 (4).

Moore, Susan. 2007. **An Introduction to Forest Certification**. NCSU Forestry Extension. Woodland Owner Notes. 42. *http://www.ces.ncsu.edu/forestry/pdf/WON/won42.pdf*